REVIEW ARTICLE

Shoulder & Elbow

Shoulder & Elbow
2019, Vol. 11(5) 321–331

DOI: 10.1177/1758573218811656
journals.sagepub.com/home/sel
SAGE

Diagnostic utility of the Active Compression Test for the superior labrum anterior posterior tear: A systematic review

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Abstract

Background: The Active Compression Test has been proposed to have high diagnostic accuracy for superior labrum anterior to posterior tears. The aim of this systematic review was to compile the available evidence for this test and evaluate its diagnostic accuracy.

Methods: The databases PubMed, Embase, Cochrane, CINAHL, and SCOPUS were searched for case control, diagnostic studies that evaluated the Active Compression Test between 1999 (date of test introduction) and February 2018. Two independent review authors screened the search results, assessed the risk of bias using QUADAS-2, and extracted the data.

Results: Eighteen studies (pooled sample = 3091) were included in this review. Twelve out of 18 studies either had high or unclear risk of bias (66.6%). Results from the pooled analysis of all 18 studies provided that the Active Compression Test is more sensitive (71.5: 95% CI = 68.8, 74.0) than specific (51.9: 95% CI = 50.7, 53.1) and only marginally influenced posttest probability from a pretest probability of 31.7–40.72% with a positive finding and a pretest probability of 31.7–20.33% with a negative finding.

Discussion: The Active Compression Test has both limited screening and confirmation ability; therefore, we do not advocate for its use in clinical decision making.

Keywords

diagnostic accuracy, shoulder, posttest probability, superior labrum anterior to posterior, special test, Active Compression Test

Date received: 19th July 2018; revised: 2nd October 2018; accepted: 10th October 2018

Introduction

Snyder et al.[1] first coined the term SLAP (superior labrum anterior to posterior) lesion in 1990 after identifying the specific pattern of injury to the superior labrum of the shoulder arthroscopically in 27 patients with various shoulder disorders. A SLAP lesion is an injury to the fibrocartilage rim that runs along the margin of the glenoid cavity.[2] Because of the high anatomical stress at the glenohumeral joint, the labrum injury to this region is common with shearing or repetitive movements.[3] Although the reported prevalence of a SLAP lesion varies, the number of cases managed over the last decade has increased markedly as high as 26%.[4] Additionally, there is a reported 105% increase in the incidence of SLAP repairs over the last six years.[5]

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The Active Compression Test, also known as the O'Brien's test, is clinical maneuver that is designed to identify the presence of a SLAP lesion. The maneuver is one of the most commonly used by physical therapy and physicians,[6–8] with 70% of physicians indicating they use the test when examining the shoulder.[7] The test involves placing the patient's shoulder in 90° of shoulder flexion, 10° of horizontal adduction, and maximal glenohumeral internal rotation. The elbow is held in full extension. The clinician instructs the patient to resist a downward force at the wrist and asks the patient if there is any pain "on top of the shoulder" or "inside the shoulder." The arm is then moved into maximal glenohumeral external rotation and the clinician applies the same downward force at the wrist. A positive test is reported when pain occurs in glenohumeral internal rotation compared to less or no pain when applied in external rotation.[9–11]

The Active Compression Test has been examined in a number of systematic reviews. Representing only three studies, Gismervik et al.[12] found marginal diagnostic accuracy. Others have reported high sensitivity and poor specificity.[13,14] In a 2009 meta-analysis by Meserve et al.,[15] the Active Compression Test fared better than comparators, but the statistical analysis did not provide traditional diagnostic accuracy measures used to determine posttest probabilities with selected findings (e.g. positive and negative likelihood ratios (LRs)). Hegedus et al.[16,17] have provided the most comprehensive assessment of the Active Compression Test to date and cautioned against use of the tool, indicating it has poor diagnostic accuracy.

Since the 2012 paper by Hegedus et al.[17] a number of new papers have been published.[4,7,8,12,14,18] None of the aforementioned reviews differentiated results by severity of condition, such as Snyder's classification, which reflects the amount of labral damage and the involvement of the biceps tendon.[2] Subsequently, the purpose of this study was twofold: (1) compile the data found from all available research and pool the diagnostic utility of the Active Compression Test, and (2) compare results in those studies that evaluated Snyder's classification. We hypothesized that the diagnostic accuracy of the Active Compression Test would improve with more severe conditions of SLAP lesions (Snyder's classifications).

Methods

Search strategy

This review was completed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[19] Studies published between 1999 (date of introduction of the Active Compression test) and 2 February 2018 were identified through a systematic search of PubMed, Embase, Cochrane Central Register of Controlled Trials, CINAHL, and SCOPUS. A manual search of reference lists and included studies were also conducted. A search strategy was generated after consultation of a biomedical librarian using the following keywords: "shoulder joint" OR "SLAP" OR "superior labrum" AND "O'Brien's" OR "active compression." Only studies published in English language were included. Following development of this search strategy, this systematic review was registered on PROSPERO on 13 October 2017.

Study selection

Studies were eligible for this systematic review only if the following inclusion criteria were met: (i) case control, diagnostic studies, prospective or retrospective; (ii) patients with shoulder dysfunction including a SLAP tear; (iii) the Active Compression (O'Brien's) Test was administered by a properly qualified examiner (surgeon, MD, DO, PT, etc.) in an attempt to clinically diagnose the SLAP lesion; and (iv) diagnostic accuracy, sensitivity, specificity, and LRs were reported for the Active Compression Test and compared to either arthroscopic or magnetic resonance imaging (MRI) evaluations. Exclusion criteria were as follows: (i) case reports, qualitative studies, or editorials/letters/comments; (ii) presence of unrelated shoulder pathology such as fracture, tumor, adhesive capsulitis, or rheumatoid arthritis; (iii) pregnancy; (iv) cervical radiculopathy; (v) cognitive impairment; (vi) patients received corticosteroid injections during examination; and (vii) other diagnostic tests were used without additional comparison to arthroscopic evaluation.

Selection process

Two authors independently screened (BMH and KC) electronically identified studies based on titles, and two authors subsequently screened the abstracts of the newly remaining studies. Two authors (CD and JI) independently screened the full-text articles for fulfillment of inclusion criteria. Disagreements were resolved via a consensus meeting and screened by a third author (CEC) if any uncertainty remained.

Methodological quality/risk of bias assessment

The risk of bias and applicability of these studies was evaluated by independent reviewers (SE and JI) using the *Quality Assessment of Diagnostic Accuracy Studies* (QUADAS-2) scale. QUADAS-2 encompasses four domains: (1) patient selection, (2) index test,

(3) reference standard, and (4) flow and timing. Whiting et al.[20] contend that each domain is assessed for risk of bias, and the first three domains should also be assessed for applicability. QUADAS-2 differs from the original QUADAS in that included questions help judge risk of bias through these domains and ask additional questions regarding applicability (i.e. do the patients in the included study match the review question?). The tool is designed to allow for more transparent rating of bias and applicability of primary diagnostic accuracy studies. The potential risk of bias associated with each domain was rated as low, high, or unclear. A study was rated as having a "low risk of bias" or "low concern regarding applicability" when all domains were assessed as "low." If a study was rated "high" or "unclear" in one or more domains, then it was judged "at risk of bias" or as having "concerns regarding applicability."[21]

Data extraction and analysis

For each study, the number of subjects, a descriptive summary of the patients included, the types of diagnoses, the types of tests analyzed, and the reference standards for comparison were recorded. We also extracted sensitivity, specificity, positive and negative predictive value, and positive and negative LRs. Sensitivity reflects the proportion of patients with a SLAP tear correctly identified by a positive Active Compression Test. Specificity reflects the proportion of patients without a SLAP tear correctly identified by a negative Active Compression Test. Positive predictive value is the probability that subjects with a positive screening test truly have the disease, whereas a negative predictive value is the probability that subjects with a negative screening test truly do not have the disease.[22]

A positive likelihood ratio (LR+) reflects the probability of a patient with a SLAP tear and a positive Active Compression Test divided by the probability of a patient without a SLAP tear and a positive Active Compression Test. In contrast, a negative likelihood ratio (LR−) reflects the probability of a patient with a SLAP tear and a negative Active Compression Test divided by the probability of a person without a SLAP tear and a negative Active Compression Test.[22] Although values are always context specific, higher positive LRs are useful to rule in a condition. A low negative LR (near zero) is associated with the ability to rule out a condition. Past authors have suggested that a LR+ of 5.0 or greater whereas a LR− of 0.20 or less has a moderate influence on posttest probability.[23]

Posttest probabilities of a positive and negative finding were calculated for each study, by taking the pretest probability of the study and analyzing the posttest probability of a positive or negative finding of the Active Compression Test. Pretest probability for each study was determined by calculating the number of cases of SLAP lesions in comparison to the total cases. A "grand" diagnostic accuracy of the Active Compression Test and its posttest probability of a positive and negative finding were calculated by summing each of the cells for true positives, false negatives, true negatives, and false positives, from the 2×2 contingency tables from each study. In studies in which the 2×2 contingency tables were not reported, we back-calculated the findings to determine cell counts. Two "grand" diagnostic accuracy analyses were completed, one with the data involving the seminal publication by O'Brien et al. and one without. O'Brien's publication discovered and named the test; however, many studies have shown the original statistics to be overly optimistic.

The website http://statpages.info/ctab2x2.html was used to complete the pooled analysis of diagnostic accuracy values, with their 95% confidence intervals (CIs).[21]

Results

Study selection

Two hundred and seventeen records were identified through database searching and 108 studies remained after duplicates were removed. Full-text articles were assessed for eligibility and 18 remained for quality assessment and data extraction (total sample = 3091 participants). The inclusion process of this review is outlined in Figure 1. There were no disagreements about either the number of studies eligible for inclusion or data results.

Eight studies[9,24–30] studied patient populations presenting with variable shoulder pathologies (including impingement, rotator cuff tears, and other pathologies) in addition to SLAP lesions. Seven studies[10,30–35] examined patients presenting with general shoulder pain. Three studies[36–38] inspected shoulder pathology in only athletes and two[25,39] looked at patients with preoperative shoulder pathologies. Reference standards included arthroscopic surgery (12 studies) and MRI (6 studies). Study specifics are located in Table 1.

Methodological quality of included studies

The results of the QUADAS-2 assessment for each of the 18 studies are presented in Table 2 and Figures 2 and 3. More than half of included studies had low risk of bias for patient selection (55.5%), reference standard (55.5%), and flow/timing domains (83.3%). Many of the limitations for the analyzed studies reflected index

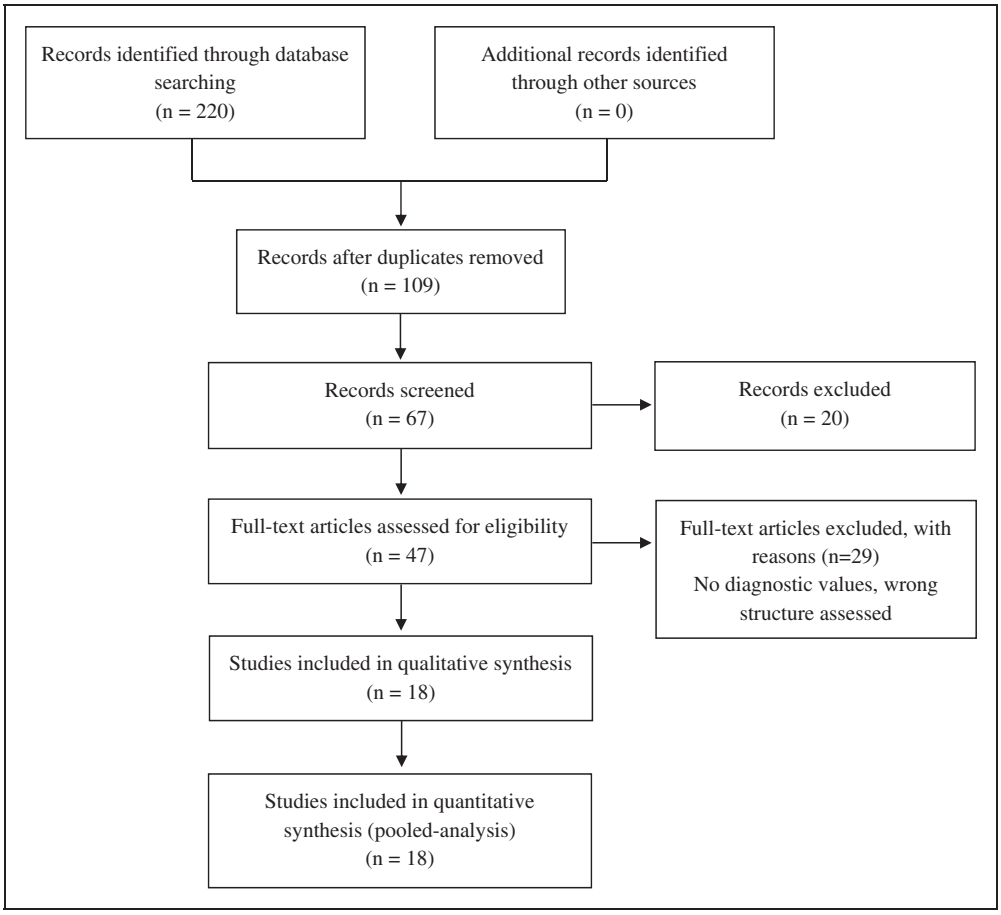

Figure 1. PRISMA flow sheet for the study.

testing, with 12 (66.6%) out of 18 studies either demonstrating high or unclear risk of bias. This suggests that the index tests of these studies were possibly interpreted with the knowledge of results from the reference standard. Additionally, there was no knowledge of thresholds for index tests or whether they were prespecified within these studies. There are also further concerns of three individual studies[8,31,39] possessing high or unclear risk of bias in three or more domains. Two studies[25,28] had high applicability concerns in regard to the research question.

Diagnostic accuracy findings

Statistical data extracted from each study included sensitivity (ranges, 0.31, 1.00), specificity (ranges, 0.11, 0.98), LR+ (ranges, 0.78, 66.66), LR− (ranges, 0.0–2.0), negative predictive value (ranges, 0.14, 1.0), and positive predictive value (ranges, 0.01, 0.94), and posttest probability (Table 3). The majority of studies reported the Active Compression Test was a sensitive test, with only 3 of the 18 studies finding the physical test as more specific than sensitive. Of the 18 studies, only three[10,25,31] found the test to moderately influence posttest probability greater than 10% with a positive and negative finding.

Only five studies[9,11,24,32,35] looked at the Snyder's classification tables in some capacity. These studies also found that the Active Compression Test was more sensitive (ranges, 0.50, 0.94) than specific (ranges, 0.14, 0.60). Michener et al.[32] and Walsworth et al.[35] divided SLAP lesions into two groups, type I and type II–IV. Yet, in their results, the groups were combined into one final value. Cook et al.[9] reported the number of patients in each of the Snyder's classifications but did not analyze the diagnostic accuracy by classification. Additionally, Ebinger et al.[24] alluded to type II lesions in their study but for the purposes of creating a new test to detect these specific lesions. Schlechter et al.[29] and Nakagawa et al.[38] briefly mentioned that some of their subjects had type II, III, or IV lesions as well but also did not expand on this information.

Results from the pooled analysis of all 18 articles are provided in Table 4. The Active Compression Test is more sensitive (71.5: 95% CI = 68.8, 74.0) than specific (51.9: 95% CI = 50.7, 53.1) and influences posttest probability from a pretest probability of 31.7% to a

Table 1. Description, tests, and reference standard of included studies (n = 18).

Study	Description of the sample	Reported Snyder classification	Reference standard
Cook et al.[9]	87 patients with variables shoulder pathologies, i.e. impingement, RC tear (data in table associates with SLAP lesions)	Yes	MRI
Ebinger et al.[24]	150 patients (wide variety of shoulder pathologies, data in table associates with SLAP lesions)	Yes	MRI
Fowler et al.[36]	101 recreational athletes with various shoulder pathologies (data in table associates with SLAP lesions)	No	Arthroscopy
Walsworth et al.[35]	55 patients presenting with shoulder pain	Yes	Arthroscopy
Guanche and Jones[25]	60 patients with preoperative shoulder pathologies	No	MRI
Kibler et al.[31]	325 patients who were evaluated for shoulder pain. 101 underwent surgery	No	MRI
McFarland et al.[39]	426 patients who underwent surgery	No	Arthroscopy
Myers et al.[37]	40 athletes	No	Arthroscopy
Nakagawa et al.[38]	54 athletes who underwent surgery	Yes	Arthroscopy
O'Brien et al.[10]	268 patients with shoulder pain w/o previous diagnostic evaluation	No	Various combinations of radiography, MRI, and clinical data
Oh et al.[11]	146 patients who were diagnosed with Type II SLAP lesion, some had multiple pathologies	No	Arthroscopy
Pandya et al.[28]	51 consecutive patients with arthroscopically confirmed SLAP lesions and no history of shoulder dislocation	No	MRI and/or MRI arthrogram
Parentis et al.[33]	132 consecutive patients scheduled to undergo diagnostic shoulder arthroscopy	No	Shoulder arthroscopy
Schlechter et al.[29]	254 patients with previous arthroscopy	No	Arthroscopic findings
Sodha et al.[30]	610 control patients with no SLAP lesion but with other abnormalities 9 patients with isolated SLAP lesions 155 patients with concomitant SLAP lesion who had a SLAP and another shoulder abnormality.	No	Diagnostic arthroscopy
Stetson and Templin[34]	65 patients (45 men, 20 women)	No	Diagnostic shoulder arthroscopy
Michener et al.[32]	55 (47 men, 8 women; age 40.6 ± 15.1) Presenting with shoulder pain	Yes	Intraoperative diagnosis
Hegedus et al.[40]	48 with preliminary chronic impingement syndrome Planned arthroscopic decompression	No	Shoulder arthroscopy

RC: rotator cuff; SLAP: superior labrum anterior to posterior.

Table 2. Methodological quality of included studies (QUADAS-2).

Study	Risk of bias				Applicability concerns		
	Patient selection	Index test	Reference standard	Flow and timing	Patient selection	Index test	Reference standard
Cook et al.[9]	Low	Low	High	Low	Low	Low	Low
Ebinger et al.[24]	High	Low	Low	High	High	Low	Low
Fowler et al.[36]	Low	Unclear	Low	High	Low	Low	Low
Walsworth et al.[35]	Low	High	Low	Low	Low	Low	Low
Guanche and Jones[25]	High	High	Low	Low	Unclear	High	Low
Kibler et al.[31]	Low	High	High	High	Low	Low	Low
McFarland et al.[39]	Unclear	Unclear	High	Low	Low	Low	Low
Myers et al.[37]	High	High	Low	Low	Low	Unclear	Low
Nakagawa et al.[38]	Low	Low	High	Low	Low	Low	Low
O'Brien et al.[10]	High	High	Low	High	Low	Low	Low
Oh et al.[11]	Low	High	High	Low	Low	High	Low
Pandya et al.[28]	Low	High	Low	Low	Low	High	High
Parentis et al.[33]	Low	High	Low	Low	Low	Low	Low
Schlechter et al.[29]	High	Low	Low	Low	Low	Low	Low
Sodha et al.[30]	Low	Unclear	High	Low	Low	Low	Low
Stetson and Templin[34]	Unclear	Low	Unclear	Low	High	Low	Low
Michener et al.[32]	Low	Unclear	Low	Low	Low	Low	Low
Hegedus et al.[40]	Unclear	Low	Unclear	Low	High	Low	Low

Scoring: high risk, low risk, unclear.

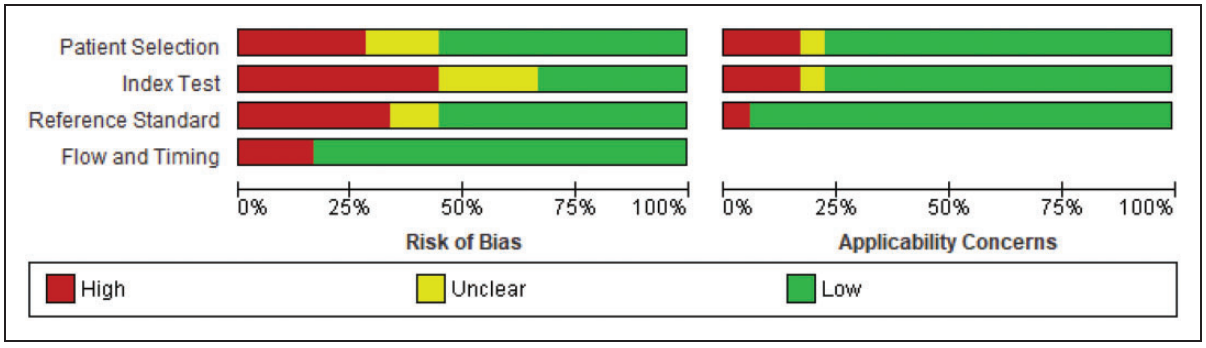

Figure 2. Risk of bias and applicability concerns: review authors' judgments about each domains presented as percentages across included studies (n = 18).

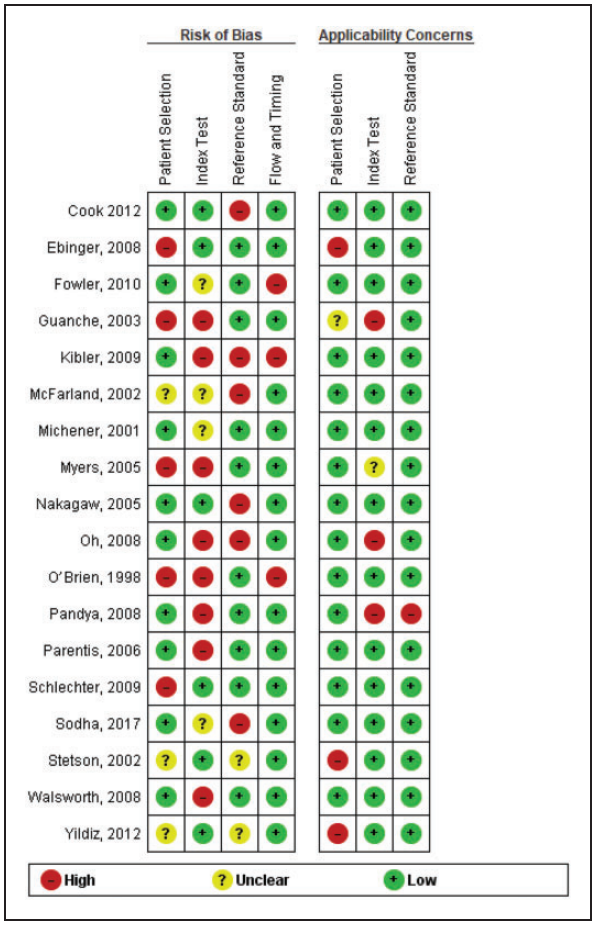

Figure 3. Risk of bias and applicability concerns.

posttest probability 40.7% with a positive finding and 31.7–20.3% with a negative finding. When the O'Brien et al.[10] is removed, the results also change. The Active Compression Test is still more sensitive (69.6: 95% CI = 66.9, 72.3) than specific (45.9: 95% CI = 44.5, 47.2), but there is only marginal improvement in posttest probability with a positive (change in posttest probability from 32.9 to 38.5%) and negative finding (change in posttest probability from 32.9 to 24.4%) (Table 5).

Discussion

Summary of main findings

The main purpose of this systematic review was to investigate the diagnostic utility of the Active Compression Test for SLAP lesions compared to MRI and arthroscopy. The second aim was to investigate whether SLAP lesion differentiation (Snyder's classifications) was included in the studies and its influence on diagnostic accuracy of Active Compression Test. Despite that the Active Compression Test is a commonly used test in clinical practice, this review of 18 studies demonstrates that this test has poor diagnostic accuracy. Regarding the second aim, this review found that very few studies incorporated Snyder's classification, and in their results the groups were combined into one final value. It remains unclear whether the diagnostic accuracy of the Active Compression Test would improve with more severe SLAP lesions. The remaining aspect of the discussion will reflect our initial aim.

Interpretation of main findings

In diagnostic accuracy studies, bias often inflates the discrimination ability of a test and falsely suggests the study has more diagnostic utility than it may have in clinical practice. In the 18 included studies, more than half had low risk of bias for patient selection, reference standard, and flow/timing domains. The majority of the limitations surrounded index testing with 66% of the studies exhibiting bias in this area. Within the QUADAS-2, index test bias reflected whether the test was performed consistently; whether the tests were performed without knowledge of the reference test; and how technology, execution, or interpretation could influence the findings.[40] Interestingly, with 66% of the studies reflecting some level of bias with index testing, we would expect to see even stronger diagnostic values for the Active Compression Test. There is a chance that unbiased test values are actually less diagnostic than those identified in these studies.

The majority of included studies showed high sensitivity but poor specificity. Although it has long been promoted that physical tests have value when they are independently sensitive or independently specific, it is now known that this is not always the case. Clinicians and researchers have previously promoted the use of the mnemonics SpPIn (if specificity is high, a positive test rules in pathology) and SnNOut (if sensitivity is high, a negative test rules out pathology).[25] Because the specificity of the Active Compression Test is so low, a negative finding of the Active Compression Test only influenced the posttest probability by < 10%. This suggests the test inherently increases the risk of failing to rule out a SLAP lesion when it is indeed absent. A positive finding is related to < 5% change in posttest probability from pretest probability findings in most of the studies and in the pooled analysis.

Findings in the context of other literature

Our data are consistent with other systematic reviews. Powell et al.[18] concluded that the passive compression

Table 3. Diagnostic accuracy of the Active Compression Test.

Study	SN	SP	PPV	NPV	LR+	LR−	Pretest probability (%)	Posttest probability
Cook et al.[9]	0.91	0.14	0.66	0.44	1.1	0.67	63.2	+: 65.4% −: 53.5%
Ebinger et al.[24]	0.94	0.28	0.55	0.83	1.31	0.21	44	+: 50.7% −: 14.2%
Fowler et al.[36]	0.64	0.43	0.56	0.51	1.13	0.84	57	+: 60.0% −: 52.7%
Walsworth et al.[35]	0.50	0.38	–	–	0.80	1.32	80	+: 76.2% −: 84.1%
Guanche and Jones[25]	0.47	0.73	0.87	0.40	2.33	0.507	55	+:74.0% −: 38.3%
Kibler et al.[31]	0.61	0.84	0.80	0.67	3.83	1.02	48	+: 78.0% −: 48.5%
McFarland et al.[39]	0.47	0.55	0.10	0.91	1.044	0.964	8.9	+: 9.2% −: 8.6%
Myers et al.[37]	0.54	0.111	0.70	0.143	0.88	2.00	73	+: 70.4% −: 84.4%
Nakagawa et al.[38]	0.63	0.60	0.52	0.62	1.35	0.77	44	+: 51.5% −: 37.7%
O'Brien et al.[10]	1.0	0.985	0.946	1.0	66.66	0.00	20	+: 94.3% −: 0.00%
Oh et al.[11]	0.63 (0.65)	0.53 (0.53)	0.53 (0.33)	0.61 (0.81)	1.34 (1.38)	0.70 (0.66)	47	+54.3% −: 38.3%
Pandya et al.[28]	0.90	NR	–	–	–	–	100	+:NA −:NA
Parentis et al.[33]	0.652	0.486	0.211	0.869	1.268	0.716	30	+: 35.2% −: 23.5%
Schlechter et al.[29]	0.59	0.92	0.69	0.88	7.38	0.45	24	+: 70.0% −: 12.4%
Sodha et al.[30]	0.78	0.24	0.01	0.99	1.08	1.00	21	+: 22.3% −: 21.0%
Stetson and Templin[34]	0.31	0.54	0.34	0.50	0.783	1.48	18	+: 14.7% −: 24.5%
Michener et al.[32]	0.50	0.38	0.163	0.773	0.80	1.32	95	+: 93.8% −: 96.2%
Hegedus et al.[40]	0.941				NR	NR	67	+: NA −: NA

LR+: positive likelihood ratio; LR−: negative likelihood ratio; NA: not applicable; NPV: negative predictive value; PPV: positive predictive value; SN: sensitivity; SP: specificity.

Table 4. Pooled analysis full composite of studies (n = 18 studies).

Diagnosis of SLAP lesion (all forms)	Diagnosis of other condition
631 = True positive	915 = False positive
252 = False negative	987 = True negative
Sensitivity = 71.5 (68.8, 74.0)	
Specificity = 51.9 (50.7, 53.1)	
Positive likelihood ratio = 1.48 (1.39, 1.57)	
Negative likelihood ratio = 0.55 (0.49, 0.62)	
Posttest probability with a positive finding (31.7% sample prevalence) = 40.72%	
Posttest probability with a negative finding (31.7% sample prevalence) = 20.33%	

Table 5. Pooled analysis studies with O'Brien removed (n = 17 studies).

Diagnosis of SLAP	Diagnosis of other condition
578 = True positive	914 = False positive
252 = False negative	775 = True negative
Sensitivity = 69.6 (66.9, 72.3)	
Specificity = 45.9 (44.5, 47.2)	
Positive likelihood ratio = 1.28 (1.21, 1.36)	
Negative likelihood ratio = 0.66 (0.58, 0.74)	
Posttest probability with a positive finding (32.9% sample prevalence) = 38.56%	
Posttest probability with a negative finding (32.9% sample prevalence) = 24.44%	

tests provided therapists with the greatest confidence to rule out and rule in a SLAP lesion. The update of an original systematic review by Hegedus et al.[17] revealed the relocation test to have the best sensitivity and the Yergason's test to have the best specificity in identification of SLAP tears, and cautioned against the use of the Active Compression Test due to inconsistent data and failed attempts to replicate previously established results. Our updated review reflects no changes in the findings of others and supports a general trend that the Active Compression Test lacks diagnostic accuracy.

Others have suggested that the Active Compression Test only has utility when used in combination with other tests.[18] Indeed, clustering test findings is a commonplace practice among clinicians and has been advocated previously in making diagnoses.[40] However, it is worth noting that the mathematical regression modeling methods used in building conditions in clustered analyses always require a minimum of one test with high sensitivity, regardless of its discrimination value.[40] In many clustered studies, the one sensitive "finding" is typically represented by age, or another variable that casts a wide net and includes a majority of the study participants. Essentially, the Active Compression Test could be serving that role in the clustered model.

Strengths and limitations of the review

The strengths of this review include prospective registry, use of PRISMA recommendations, and use of a sensitive search strategy. Furthermore, two independent authors conducted screening of studies, data extraction, and assessment of methodological quality using the QUADAS-2. MRI and arthroscopy are considered the current accepted "gold standard" for diagnosing SLAP lesion. Phillips et al.[41] revealed MRI to have a high sensitivity and specificity potentially signifying MRI is not a suitable test to evaluate the biceps labral complex for a SLAP lesion. As such, these were used as the reference standards against which the accuracy of the Active Compression Test was assessed in this review. Limitations of this study include the selection of English-only papers.

Conclusion

While the introduction of the Active Compression (vernacularly known as the O'Brien's) test was originally viewed as a promising test for SLAP lesions in the shoulder, years of studies have begun to show that its diagnostic utility is, in fact, not compelling. Clinicians should remain cautious when using the Active Compression Test in isolation when suspicious of a SLAP lesion of any severity.

Acknowledgments

The authors would like to thank biomedical librarian Leila Ledbetter, MILS, for her assistance in the search.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Review and Patient Consent

The study is exempt from Institutional Review Board requirements at Duke University.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Cook receives funding, unrelated to this study, for the National Institutes of Health, the Veterans Administration and the Department of Defense.

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